

APPENDIX C GEOLOGICAL, GEOPHYSICAL, AND H₂S INFORMATION

Geological and Geophysical Information

The MMS GOMR has determined, pursuant to 43 CFR 2.13(c)(9), that all of the items listed under Geological and Geophysical Information in this Appendix may be considered proprietary, except for the non-proprietary assessment in Item (E).

Your EP should be accompanied by:

- (A) Structure contour maps. Current structure contour maps at a scale of 1 inch = 2,000 feet (depth-based, expressed in feet subsea) drawn on the top of each prospective hydrocarbon sand, showing the entire lease block and the location of each proposed well and the locations of geological cross-sections. You may use another scale or coverage area for these contour maps on a case-by-case basis if your proposed activities cover more than one lease block and if you obtain prior approval from the Regional Supervisor. (Examples of acceptable structure contour maps can be found on the MMS Internet website at <http://www.gomr.mms.gov/homepg/regulate/regs/ntls/structmap1.pdf> and <http://www.gomr.mms.gov/homepg/regulate/regs/ntls/structmap2.pdf>.)
- (B) Interpreted two-dimensional (2-D) and/or three-dimensional (3-D) seismic lines. Page-size copies of migrated and annotated (shot points, time lines, well paths) 2-D and/or 3-D seismic lines within 500 feet of the surface locations of your proposed wells. Provide this information as an enclosure to one proprietary copy of your EP. You do not need to provide this information if the MMS GOMR has approved the surface locations of your proposed wells in previously submitted EP's and DOCD's.
- (C) Geological structure cross-sections. Interpreted geological structure cross-sections showing the location and depth of each proposed well. In addition, show at least one key horizon and the objective sands and label them using standard biostratigraphic terms. Express all depths in feet. (An example of an acceptable geological structure cross-section may be found on the MMS Internet website at <http://www.gomr.mms.gov/homepg/regulate/regs/ntls/xsection.pdf>.)
- (D) Shallow hazards report. If your proposed activities are in water depths less than 400 meters, provide two copies of a shallow hazard report based on information obtained from a high-resolution geophysical survey, or a reference to such report if you have already submitted it to the Regional Supervisor. If your proposed activities are in water depths of 400 meters or more, provide three copies of the report. If the report covers multiple leases, provide a listing. Refer to NTL No. 98-20, "Shallow Hazards Requirements," dated September 15, 1998, for guidelines.
- (E) Shallow hazards assessment. For each proposed well, an assessment of any seafloor and subsurface geological and manmade features and conditions that may adversely affect your drilling operations, prepared using the guidance in NTL No. 98-20. Include a non-proprietary version of this item in the Public Information copies of those EP's that require Coastal Zone Management consistency.

- (F) High-resolution seismic lines. Annotated (shot points, time lines, well surface locations, and proximity of wells to line) copy of the high-resolution survey line (shallow penetration subbottom profiler; medium penetration seismic profiler; and sidescan sonar in areas of complex seafloor such as fault scarps, mud mounds, mud lobes) closest to each of the proposed well locations. Provide this information as an enclosure to one proprietary copy of your EP. You do not need to provide this information if the MMS GOMR has approved the surface locations of your proposed wells in previously submitted EP's and DOCD's.

For deepwater areas, you may replace the high-resolution survey lines with 3-D survey information on a case-by-case basis if you submit the following displays: swath bathymetry/seafloor rendering/edge detection (fault scarp trends) overlain with the seafloor amplitude. However, the vertical resolution of the 3-D surveys is usually not sufficient to detect potential drilling hazards in a complex area (numerous faults, gas vents, slumps, hard bottoms, etc.). Therefore, in a complex area, you may **not** replace high-resolution survey lines with 3-D survey information. However, in deepwater areas, you do not need to provide sidescan sonar in water depths greater than 300 meters or magnetometer lines in water depths greater than 200 meters if you obtain the prior approval of the Regional Supervisor on a case-by-case basis.

- (G) Stratigraphic column. A generalized biostratigraphic/lithostratigraphic column from the seafloor to the total depth of each prospect. Label objective horizons on the column. (An example of an acceptable stratigraphic column may be found on the MMS Internet website at <http://www.gomr.mms.gov/homepg/regulate/regs/ntls/stratcolumn.pdf>.)
- (H) Time vs. depth tables. For proposed well locations in areas where there is no well control, seismic travel time versus depth tables showing intervals of not more than 10 milliseconds.

Your DOCD should be accompanied by:

- (A) Structure contour maps. Current structure contour maps at a scale of 1 inch = 2,000 feet (depth-based, expressed in feet subsea) drawn on the top of each productive hydrocarbon sand, showing the entire lease block and the location of each proposed well and the locations of geological cross-sections. You may use another scale or coverage area for these contour maps on a case-by-case basis if your proposed activities cover more than one lease block and if you obtain prior approval from the Regional Supervisor. (See MMS Internet websites previously referenced for examples.)
- (B) Interpreted two-dimensional (2-D) and/or three-dimensional (3-D) seismic lines. Page-size copies of migrated and annotated (shot points, time lines, well paths) 2-D and/or 3-D seismic lines within 500 feet of the surface locations of your proposed wells. Provide this information as an enclosure to one proprietary copy of your DOCD. You do not need to provide this information if the MMS GOMR has approved the surface locations of your proposed wells in previously submitted EP's and DOCD's.
- (C) Geological structure cross-sections. Interpreted geological structure cross-sections

showing the location and depth of each proposed well. In addition, show at least one key horizon and the objective sands and label them using standard biostratigraphic terms. Express all depths in feet. (See MMS Internet website previously referenced for example.)

- (D) Shallow hazards report. If your proposed activities are in water depths less than 400 meters, provide two copies of a shallow hazard report based on information obtained from a high-resolution geophysical survey, or a reference to such report if you have already submitted it to the Regional Supervisor. If your proposed activities are in water depths of 400 meters or more, provide three copies of the report. If the report covers multiple leases, provide a listing. Refer to NTL No. 98-20, "Shallow Hazards Requirements," dated September 15, 1998, for guidelines.
- (E) Shallow hazards assessment. For each proposed well or platform location, an assessment of any seafloor and subsurface geological and manmade features and conditions that may adversely affect your operations, prepared using the guidance in NTL No. 98-20. Include a non-proprietary version of this item in the Public Information copies of those DOCD's that require Coastal Zone Management consistency.
- (F) High-resolution seismic lines. Annotated (shot points, time lines, well surface locations, and proximity of wells to line) copy of the high-resolution survey line (shallow penetration subbottom profiler; medium penetration seismic profiler; and sidescan sonar in areas of complex seafloor such as fault scarps, mud mounds, mud lobes) closest to each of the proposed well locations. Provide this information as an enclosure to one proprietary copy of your DOCD. You do not need to provide this information if the MMS GOMR has approved the surface locations of your proposed wells in previously submitted EP's and DOCD's.

For deepwater areas, you may replace the high-resolution survey lines with 3-D survey information on a case-by-case basis if you submit the following displays: swath bathymetry/seafloor rendering/edge detection (fault scarp trends) overlain with the seafloor amplitude. However, the vertical resolution of the 3-D surveys is usually not sufficient to detect potential drilling hazards in a complex area (numerous faults, gas vents, slumps, hard bottoms, etc.). Therefore, in a complex area, you may **not** replace high-resolution survey lines with 3-D survey information. However, in deepwater areas, you do not need to provide sidescan sonar or magnetometer lines if you obtain the prior approval of the Regional Supervisor on a case-by-case basis.

Hydrogen Sulfide (H₂S) Information

Your EP should be accompanied by:

- (A) Classification. According to 30 CFR 250.417(c), a request that the Regional Supervisor classify the area of your proposed exploration activities as either H₂S absent, H₂S present, or H₂S unknown. Provide sufficient information (including reference to correlative stratigraphic sections) to justify your request.
- (B) H₂S Contingency Plan. If you request that the Regional Supervisor classify the area of your proposed exploration activities as either H₂S present or H₂S unknown, include a reference to an approved or submitted H₂S Contingency Plan prepared according to 30 CFR 250.417(f) that covers the proposed exploration activities. If you have not yet submitted an H₂S Contingency Plan, include the following statement: [*Company name*] will submit to the appropriate MMS GOMR district office an H₂S Contingency Plan prepared according to 30 CFR 250.417(f) before conducting the proposed exploration activities.

Your DOCD should be accompanied by:

- (A) Classification. According to 30 CFR 250.417(c), a request that the Regional Supervisor classify the area of your proposed development and production activities as either H₂S absent, H₂S present, or H₂S unknown. Provide sufficient information (including reference to correlative stratigraphic sections) to justify your request.
- (B) H₂S Contingency Plan. If you request that the Regional Supervisor classify the area of your proposed development and production activities as either H₂S present or H₂S unknown, include a reference to an approved or submitted H₂S Contingency Plan prepared according to 30 CFR 250.417(f) that covers the proposed development and production activities. If you have not yet submitted an H₂S Contingency Plan, include the following statement: [*Company name*] will submit to the appropriate MMS GOMR district office an H₂S Contingency Plan prepared according to 30 CFR 250.417(f) before conducting the proposed development and production activities